Chemistry I Honors

Elements and Compounds
Introduction

All matter is composed of atoms!

Atoms and Elements

- **Atoms**–the building block of matter
- smallest unit of an element that maintains the properties of that element
- One of the 114+ basic types of atoms that make up substances
- Each **element** has a unique set of chemical and physical properties that distinguishes it from the other elements

Element:

- A substance that cannot be chemically converted into simpler substances
- a substance in which all of the atoms have the same number of protons and therefore the same chemical characteristics.

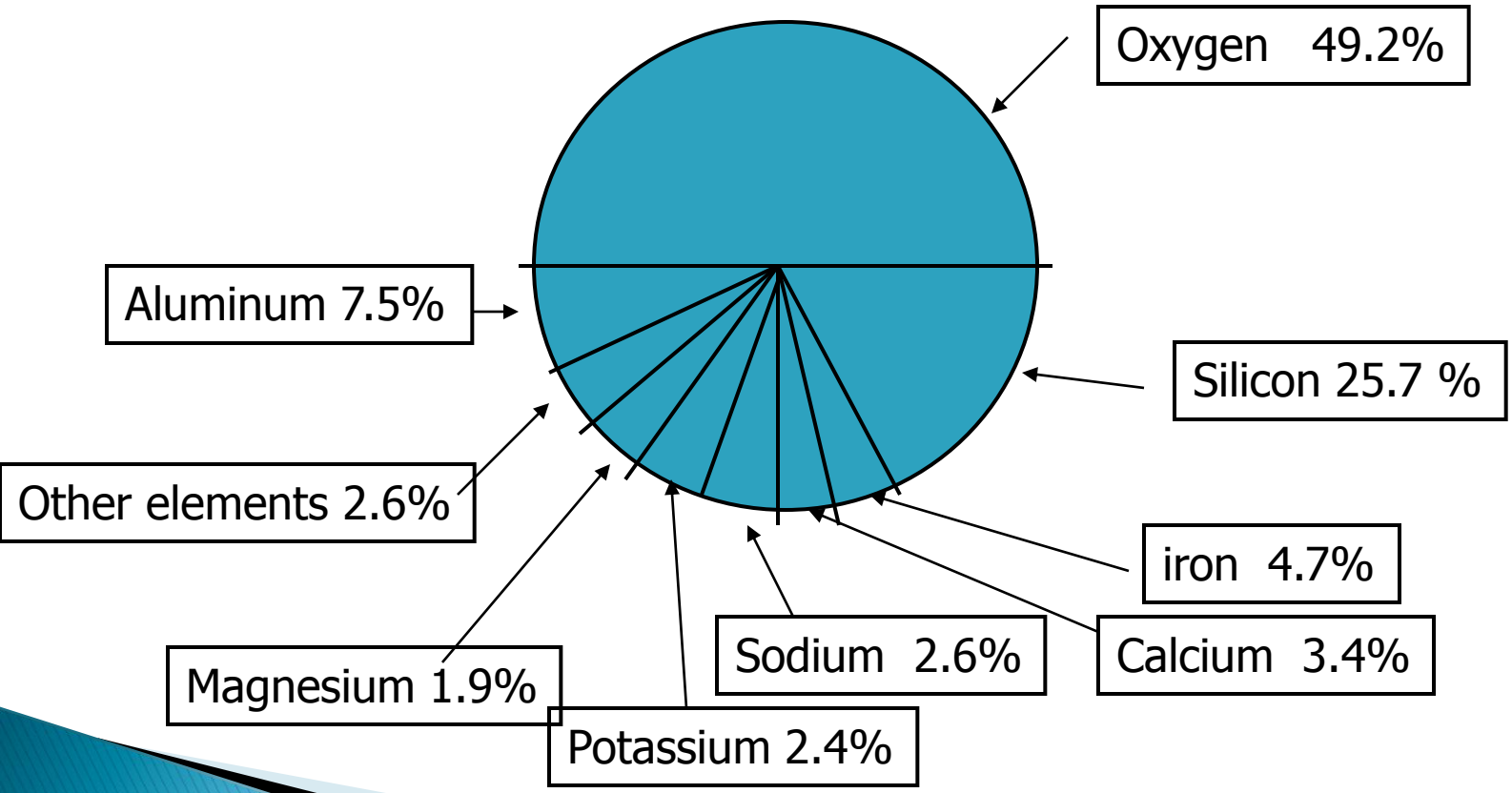
Symbol

- Letters that represent an element
- It originates from:
  - Latin, Greek, German, English, etc.
  - In honor of a person
  - After the place it was discovered

Earth's crust

- There are 114+ known elements
- The most common element is hydrogen
- Oxygen and silicon make up more than 70% of the mass of the Earth's crust

Earth's crust



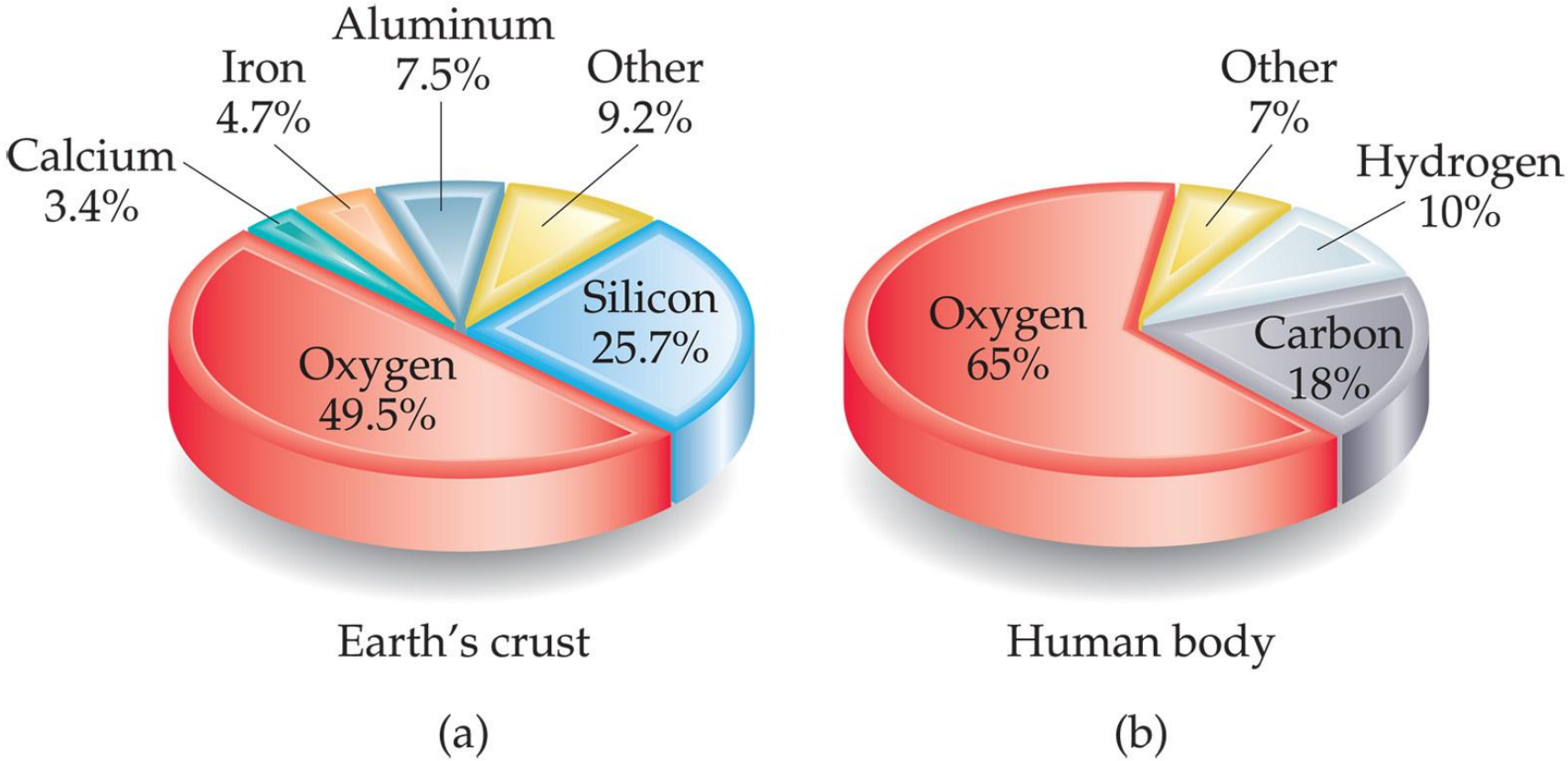
Composition of the human body

- By mass, human cells consist of 65–90% water (H_2O), and a significant portion is composed of carbon-containing organic molecules.
- Oxygen therefore contributes a majority of a human body's mass, followed by carbon.
- 99% of the mass of the human body is made up of the six elements oxygen, carbon, hydrogen, nitrogen, calcium, and phosphorus.

Dietary minerals necessary for the human body

- Dietary minerals

Comparisons:



114+ known elements

- 83 are stable and found in nature.
  - Many of these a very rare.
- 7 are found in nature but are radioactive.
- 24+ are not found naturally on the earth.
  - 2 or 3 of these might be found in stars.

Compound

- **Compound**- substance that is made from the atoms of two or more elements that are chemically bonded.
- the atoms of these elements always combining in the same whole-number ratio.
- There are two types of compounds:
  - Organic compound
  - Inorganic compound

Compound:

- A compound is considered a pure substance
- Cannot be separated by physical means

Organic compounds

- Living things also are made up of elements
- They are mainly made up of
  - Hydrogen
  - Carbon
  - Oxygen
  - Nitrogen
- They are called organic substances

  Examples

$C_6H_{12}O_6$	glucose
$C_9H_8O_4$	aspirin
$C_{13}H_{18}O_2$	ibuprofen

Inorganic compound

- Usually contains no carbon
- If it does contain carbon there is no hydrogen

Examples:

H_2O

CO_2

NaCl